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I, JULIE BILLINGSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. PR 9865 for a patent by JONATHON CHARLES HELMER and RICHARD JAMES NEIL HELMER as filed on 09 January 2002.

WITNESS my hand this
Twenty-seventh day of January 2003

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AUSTRALIA

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PROVISIONAL SPECIFICATION

Invention title: IDENTIFICATION SYSTEM

The invention is described in the following statement:

[Title] Identification System

Field of the invention

The invention relates to an identification system. More particularly, it relates to a system of identification labelling wherein the information contained in the identifier or label may be updated.

Background of the invention

In this specification, where a document, act or item of knowledge is referred to or discussed, this reference or discussion is not an admission that the document, act or item of knowledge or any combination thereof was at the priority date:

(i) part of common general knowledge; or

(ii) known to be relevant to an attempt to solve any problem with which this specification is concerned.

A wide range of items have information material attached to or in association with them. Such information would commonly include identification of the goods and manufacturing, transport, storage and/or price. This information may be in many forms including alpha-numeric characters, symbols, optical codes (such as bar codes) or combinations of forms.

It is sometimes desirable to indicate information about the history of the items. For example, whether the item has been exposed to high levels of moisture, or whether a sealed container has been opened. Such indication can be given by inclusion on the labelling of a chemically sensitive patch which changes colour on exposure to water or oxygen. Only a limited range of information can be displayed in this way, and this information can only be read by a limited number of methods

Object of the invention

It is an object of the present invention to provide an alternative type of modifiable identification .

Summary of the invention

The invention uses substances which are capable of changing colour when exposed to a stimulus such as an electric current, temperature change, exposure to electro-magnetic radiation, moisture change, exposure to certain chemicals or exposure to pressure. Such a stimulus will be referred to as an 'activating event' in this specification. The substances will usually be in the form of, or capable of being used as, inks or transferable films. One

or more of these substances may be used, usually in combination with a conventional marking material (e.g. black or coloured ink) which will be referred to as 'permanent material' in this specification. These are applied to a surface to form an identification mark or marks. Typically the identification mark will be in the form of a bar code and/or an alphanumeric designation which may be machine readable. At least some components of the marks will include areas formed from the colour changing substances, conveniently there will also be areas of such components which are formed from permanent material. Therefore, when first formed such a component of the mark will be read in a particular way by the eye or by a reading machine, but if an activating event has occurred the component of the mark will change in its appearance. If the code is then read by eye or by machine, an indication will be given that at some time in its history the mark has been exposed to the environment in which resulted in the activating event.

For example, if the code includes alphabetic characters, it is possible for a character to be printed from permanent material to form an 'I' and to also incorporate a colour changing substance which is initially not detected but which after an activating event changes colour and adds to the detected character so that it becomes a 'P' it would be possible to add regions of one or more additional colour changing substances such that a more extreme environment would result in an additional portion changing colour so that the character would then be detected as a 'B'. Conversely colour changing substances which cease to be detectable after exposure to an activating event could be used such that the order of events would be reversed, that is 'B' could change to 'P' which could change to 'I'. A combination of colour changing substances one or more of which become detectable after exposure to an activating event, and one or more others of which cease to be detectable after an activating event permit a wider range of character changes to be detected.

Bar codes have lines of various width of dark colour interspersed with lines of various width of light colour (usually the background colour of the label on which the bar code is printed). The relative widths of the dark and light lines are adjusted to encode numeric information. If some lines (or part of the width of some lines) are formed from colour changing substances, then exposure to an activating event will result in the number corresponding to the detected code changing.

In one embodiment of the invention, the colour changing substance is one which is capable of changing colour in response to an electric current. One example of such a substance is 'E Ink' which is described in Scientific American November 2001 at pages 38

to 43. If such a substance is used the colour change may be induced either directly or indirectly.

A directly induced colour change might be produced by applying an electric current to the electrically sensitive material, for example by an operator briefly attaching an electric cell to contacts electrically connected to an area of the character so that its appearance is changed to indicate that the item has been checked or passed through a storage or control stage. As a non-limiting example, such an arrangement might be useful in recording the manufacturing or storage history of an item.

The use of the term 'indirectly induced colour change' is to signify that some other activating event results in the flow of an electric current which causes a change of colour of the colour changing substance. Typically in such an arrangement, the electrically sensitive colour changing substance would form part of an electric circuit which would also include an electric cell and a sensor capable of functioning as an electric switch. Normally such a switch would be in the open position and no current would flow and hence no colour change would occur. If the sensor were to detect a relevant change in its environment, it would cause the switch to go to the closed position, an electric current would flow and the colour change would occur. Depending on the purpose which the change is to indicate, the colour changing substance might be one in which the colour change is only maintained while the current is flowing, or it might remain changed unless a reversing current is applied, or the change might be substantially permanent.

Non-limiting examples of possible uses of embodiments of the invention incorporating indirectly induced colour changing substances include:

Arrangements incorporating temperature or humidity sensors such that the appearance of a character is changed if the sensor has been exposed to inappropriate storage conditions, or to indicate that the item to which it is attached has been sterilised.

Chemical sensor (e.g. for ammonia) inside a food package connected to an external label to indicate that the contents have deteriorated. Such information might be automatically read by a scanner at a supermarket check-out, or visually noted by the ultimate consumer prior to use.

Chemical sensors inside a wine bottle connected to an external label capable of indicating that either the wine is not fully matured, or that it has deteriorated.

An electric circuit around a package (e.g. printed using conductive ink) connected to the electric cell and colour changing substance such that the appearance of a

character changes if the box has been tampered with so as to cause a break in the electric circuit.

Many other uses of the invention will be apparent to one skilled in the art.

Usefully, the invention may be incorporated into a bar code or other labelling system such that one part of the code contained thereon is of a permanent material and includes product identification information equivalent to that contained on conventional labels, and another part of the code includes areas of colour-changing substance which are capable of changing to indicate the storage history, state of contents or other variable information about the associated product.

Modifications and improvements to the invention will be readily apparent to those skilled in the art. Such modifications and improvements are intended to be within the scope of this invention.

Richard James Neil Helmer and Jonathon Charles Helmer 21/12/01